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ABSTRACT

This discussion of the contested/problematic concept (i.e., words that are open to debate and discussion as to their meaning) focuses on the notion of theory as one example in educational technology. Arguing that the notions of contested and problematic suggest debate, re-interpretation, and the need for dialogue with others to establish meaning, this paper suggests that through the diversity of understandings of this concept, new language can be used to talk about the work of educational technologists. It is expected that this new language, in turn, will open new possibilities for dialogue and praxis in the field of educational technology. The discussion begins by addressing the question of why theory is used. Distinctions are made between empirical-analytic sciences, the historical-hermeneutic sciences, and the critical sciences. The word theory is then discussed in the context of the field of educational technology, and it is noted that the Association for Educational Communications and Technology (AECT) definition of educational technology (1977) endorses the empirical-analytic approach, a descriptive theory concerned with prediction and control. Nagel's fourth sense of theory as a systematic analysis of a set of related concepts (1969) is seen as promising for this discussion, since theory in this sense becomes both a conceptual analysis of a given word and a normative statement of its use. It is argued that theory interpreted in this fashion becomes the grounding of new understanding and the potential for change. It is concluded that the limitations of the prediction/control cycle can be broken through hermeneutical and critical inquiry, giving the field a radically different language and conceptual basis from which to work. (6 references) (BBM)

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Theory Building and Educational Technology: Foundations for Reconceptualization

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THEORY BUILDING AND EDUCATIONAL TECHNOLOGY: FOUNDATIONS FOR RECONCEPTUALISATION

There are words, phrases, ideas that can be referred to as contested/problematic concepts, i.e. these words are open to debate and discussion as to their meaning. Not only do the meanings of these words change depending on their use, but they can mean different things to different people. This is not a radical position to espouse until it is given some specificity. For example, the words democracy, capitalism, and politics can be considered contested/problematic, depending on who utters them, or how the utterances are made. In the field of education words like education, curriculum, research, and methods can be seen as contested/problematic. The notions of contested and problematic suggest debate, re-interpretation. They suggest some notion of necessitating dialogue with others as to the establishment of meaning.

The literature within the field of educational technology does not often address itself to the issue of the contested/ problematic concept. We tend not to want to think of our field as a battleground for philosophical/theoretical debate. Yet there are contested/problematic concepts in this field. Words such as science, technology, instruction, theory, design, research, etc., can all be seen as contested concepts that are frequently used in the field of educational tecnnology. While there are on-going debates in educational literature in general,

there is not much work that looks at differing conceptualizations and frameworks within educational technology. However, when the Association for Educational Communications and Technology in the United States published the Definition of Educational Technology (1977), the intent was not to shut off such debate but rather to promote it.

The limited discussion in the recent literature of the field of educational technology is concerned with the importance of theory to the field (cf. Reigeluth, 1983). The discussion seems to center around three questions: Why use theory? What is theory? and What kind of theories are there? An explicit discussion of one of these questions will lead inevitably to an implicit discussion of the others. In this paper we will discuss the notion of theory as one example of the contested/problematic concept. We will suggest that through the diversity of understandings of this concept, new language can be used to talk about the work of educational technologists. This new language, in turn, will open new possibilities for dialogue and praxis within the field of educational technology.

WHY USE THEORY?

A useful way to enter into a discussion of theory would be to identify the differing ways for arriving at knowledge, or ways in which we know the world. This will help us to understand the nature of theoretical work. This is suggested by the work of Habermas (1971), and thus has a certain philosophical positioning in critical theory. Distinctions are made between the empirical-

analytic sciences, the historical-hermeneutic sciences, and the critical sciences. Habermas' notion of interest will also provide a conceptual framework for our discussion.

Habermas' theory of knowledge has three forms, or processes, of inquiry. Knowledge can be arrived at through empirical-analytic science, historical-hermeneutical science, and critical science. These forms/viewpoints of knowledge result in three categories of possible knowledge:

> Information that expands our power of technical control; interpretations that make possible the orientation of action within common traditions; and analyses that free consciousness from its dependence on hypostatized powers. These viewpoints originate in the interest structure of a species that is linked in its roots to definite means of social organization: work, language, and power (Habermas, 1971, p.313).

These categories of possible knowledge thus establish the "specific viewpoints" from which we can know reality in any way whatsoever: "orientation toward technical control, toward mutual understanding in the conduct of life, and toward emancipation from seemingly 'natural' constraints" (Habermas, 1971, p.311). These modes of inquiry with constitutive interests delineate the way in which individuals generate knowledge.

The notion of knowledge constitutive interests linked with the differing sciences situates theorizing within the realm of political discourse. The notion of knowledge constitutive interests means that all our attempts at explaining/understanding our world (context) are non-neutral activities. Inherent in our attempts to make sense out of our world are particular interests.

The idea of interests is not a pure abstraction, nor is it an empirical proposition. Interests are not causes or determinates in and of themselves. They are general orientations/cognitive strategies toward inquiry.

Knowledge constitutive interests are formed in the "medium of work, language and power" (Habermas, 1971, p.313). This means that language is political. The language that we express ourselves in is political. We exercise power and influence through our use of words. But, we can also exercise power and influence by determining the meaning that words have, for ourselves and for others. Thus knowledge is not neutral. The way we go about knowing is not neutral. The way we go about knowing the world happens through a dialectical relationship that we have with the world: we are shaped by our world and we help to shape that world. This also suggests that theorizing about that world is part of a social process, and therefore, theory itself can be considered a social construction. Theorizing, as a social construction/social process, arises out of humankind's desire to explain and/or understand and/or change the human condition.

Theory can serve to help explain both the conscious and unconscious, as they relate to nature, society, and our personal existence. Theory can be seen as a hypothetical proposition which can be proven/disproven through empirical testing. It suggests causal relationships (cause/effect). This notion of "explaining things" is the basis for rational thought. Nomological knowledge is the result of such endeavours.

Nomological suggests lawlike propositions based on the results of the testing of the hypotheses. This form of theory (empirical/analytic theory) has an interest in prediction and control.

Theory can serve to help humankind better understand "the world", and hence ourselves and others within a given context, the meanings attached to social customs, etc. When engaged in this form of understanding/research, the way in which we relate to what is being investigated is seen through different lenses. We use an interpretive mode of understanding/theorizing. This theoretical stance to the world sees reality as a social construction. This form of theory (historical-hermeneutic theory) has an interest in better understanding that social construction through consensual agreement.

We can use theory to gain insight into seemingly "given" realities, and through a process of reflective critique, we can examine the social construction of reality and seek ways to analyze the contradictions found in reality (the "is" and the "ought"). Through a shared vision we can begin to set about the enormous difficulty of changing individual and group context. Hence a different understanding of reality is needed in order to act within that context, to effect change. This form of theorizing (critical theory) has an interest in emancipation. By emancipation is meant the possibility of individuals freeing themselves from "law-like rules and patterns of action in 'nature' and history so that they can reflect and act on the

dialectical process of creating and recreating themselves and their institutions" (Apple, 1975, p.126). In this sense, emancipation is a continual process of the "critique of everyday life".

Fundamental differences separate these modes of knowing and theorizing. The differences are of a philosophical nature. Each mode of inquiry has its own understanding of the nature of reality (ontology), the nature of knowledge (epistemology), the nature of questions asked about reality, i.e. what is of value (axiology). The need for theory further arises when there are multiple understandings for the same reality. How do we separate out the theoretical stance that makes sense within our own experience?

WHAT IS THEORY?

Acknowledging the need for theory also involves some understanding of what theory is. Thus far we have spoken in broad and encompassing terms. In this section we want to discuss the word theory in the context of the field of educational technology. Acknowledging the need for theory also involves some understanding of what theory is. The AECT in The Definition of Educational Technology (1977) seems to have endorsed a specific notion of the meaning of the word theory. It is stated that "the term 'theory', while often used colloquially as an antonym for the terms 'practice' or 'practical' has a precise meaning:
1. a general principle, supported by considerable data, proposed as an explanation of a phenomena; a statement of the relations

believed to prevail in a comprehensive body of facts (English & English, 1958, p.551);

2. a principal or set of principles that explain a number of related facts and predict new outcomes based on these facts (Wheeler, et al., 1975, p.638)". (AECT, 1977, pp.20-21).

The AECT's idea of theory is based on the view of the "hard" sciences, or the empirical sciences. The explicit emphasis is placed on the 'facts' upon which some principles are based. A further emphasis is placed on the ideas of explanation and prediction. There is no mention of the concept of understanding. If it was considered at all it seems that it was intended to be implicitly bound to the ideas of explanation and prediction (control). But understanding a particular phenomenon is different than trying to explain or predict it. Understanding something has a different goal than explanation/prediction. Understanding looks toward the whole phenomenon, not the parts. Understanding identifies relations among parts, the interconnectedness, the gestalt. Referring to our earlier discussion, empirical-analytic theory has an interest in technical control. Understanding has a practical interest in consensual agreement, consensus as to the meaning of particular phenomenon.

Since meaning resides in individuals and not in the phenomenon, one must engage in a dialogic endeavour to reach agreement regarding the meaning of something. Through dialogue, agreement can be reached (consensus). This theoretical stance can lead to new understandings of reality, seeing something in a

new way. This use of theory suggests multiple interpretations of the same event. This form of theorizing moves back and forth between theory and practice. Theory informs practice and vice versa. This understanding of theory does not necessarily lead to action/change.

Another understanding of theory, i.e. critical theory, has an interest in emancipation. Within critical theory, emancipation suggests change, social and/or personal. Thus theory can be identified by its methodological interests: technical control, consensual agreement (understanding), and emancipation. In other words, theory can be identified by what it is "supposed to do": create nomological knowledge, i.e. law-like propositions that explain/predict/ control; offer a possible understanding of a particular phenomenon (consensus as to the meaning of something); and/or offer the possibility for emancipation.

KINDS OF THEORY

Within the field of educational technology, like other areas of study, theories can be classified as either normative or descriptive. Normative theory has to do with "the articulation and justification of a set of values" (Eisner, 1985, p.49) that identifies a coherent set of beliefs that become the grounds for action within a particular world-view. Normative theory is not concerned with prediction and control, nor empirical verification. An example of such normative theory would be the articulation of a "philosophy of life". As Eisner states, "the

roots of such theory begin as humans speculate on what is good in life and worth achieving" (Eisner, 1985, p.50).

Descriptive theory refers to "those statements or concepts that attempt to explain, usually through their power to predict, the events of the world" (Eisner, 1985, p.52). Descriptive theory is a call for action. The emphasis is placed on attaining some goal. Learning theory is an example of descriptive theory, i.e., through learning theory, we identify the processes of learning in such a way that through the application of that theory we can control the learning process, and through that control, we can predict the outcomes of learning.

These conceptions of theory, normative and descriptive, are useful categorizations but they do no close the question "What kind of theories are there?" One way to explore the question "what kind of theories are there?" is to do an analysis of how the word theory is used in various areas of academic study and then look for examples in and draw parallels to its use in the field of educational technology. According to the philosopher/scientist Ernst Nagel (1969, quoted in Kliebard, 1977, pp.262-263), there are four kinds of theory:

1) The law-like theory of the "hard" sciences such as physics and chemistry. This relates most directly to "empirical findings".

2) Theory that is supported by statistical evidence. Theories that have been developed in the study of bio-genetics are examples of this kind of theory.

3) Theory that is an attempt to identify factor variables which are major influences in a field of study. Many economic theories are of this variety. These theories attempt to identify the variables (unemployment rate, deficit spending, etc.) that may impact on the study of economics.

4) Theory as a systematic analysis of a set of related concepts. Therories from sociology that analyze how a given society operates are examples of this use of the word theory.

Nagel's discussion of theory is rooted in the empirical-analytic tradition. His first three uses of the word theory are descriptive in nature and are concerned with explanation/prediction/control. Explanations lend themselves to suggested actions. In his fourth use of the word, theory is reduced to the role of an heuristic, or operational definition, i.e. as a device or tool used to clarify areas for investigation, but not investigation itself. Thus understandings that are arrived at from this perspective are not theories, but can lead to theoretical understanding, but only after empirical investigation.

It is Nagel's fourth sense of theory that we see as promising for our discussion. Theory becomes both a conceptual analysis of a given word and a normative statement of its use. In this sense of the word theory, empirical verification is all but impossible. Since the foundational and hence major questions of education are normative in nature (i.e. "they involve choices among competing value options"), what becomes "critically important is conceptual

clarification" (Kliebard, 1977, p.263). This fourth use of the word theory is not reduced to merely heuristics, but becomes the grounding of new understanding and the potential for change (action). Theory is thus not reduced to explanation/control, but has the potential for broadening understanding (interpretation) and expanding the options for action.

CONCLUDING COMMENTS

The political implications of the AECT'S sanctioned "theory" are evident. From our discussion above regarding the historical-hermeneutic and the critical sciences, we believe the empirical-analytic view, posited as the only legitimate way of generating knowledge and hence theoretical positioning, is inadequate for dealing with the complexities of a field of study. The AECT's use/endorsement of this notion of theory has had the effect of closing the door on other uses and discussion of the term theory. The AECT also seems to equate understanding with prediction and control (explanation). This effectively reduces the intellectual investigations that it sanctions to those that can predict. Any notion of emancipation or the hermeneutic sense of understanding is not seen as legitimate. Thus the field can be seen as not only limiting what can be investigated, but it limits the possibilities of learning of those whom research in the field supposedly helps, namely the "clients" (children, the business community, etc.). This results in a prediction/control cycle: professionals are limited to certain types of investigations

(those that fit into the empirical-analytic model), and hence, "learners" are subjected to the results of this limited approach.

If we stay where we are in terms of our limited views of theory and theory building, we will cut ourselves off from the cultural sciences and the differing ways in which the world can be interpreted. Again, it is Nagel's fourth use of theory that we see as providing possibilities for our field. The prediction/control cycle can be broken through hermeneutical and critical inquiry. The hermeneutic interest in understanding and the critical interest in emancipation begin to give a radically different language and conceptual basis from which to work. This new language and interest will present new possibilities for dialogue and praxis within the field of educational technology.

Engaging in theoretical debate within our own field can lead to further explorations. These explorations will not be confined to academic matters, but will become part of personal experience. We are concerned with philosophical questions everyday: What is real? How do we know? What is of value? These are questions that effect what we do professionally. They also affect us on a deeply personal level, and become the basis for our praxis.

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THE NOTION OF THEORY AND EDUCATIONAL TECHNOLOGY:
FOUNDATIONS FOR UNDERSTANDING

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